less all his life, but unless he gains access to the outlying districts of knowledge during his student stage, and under the stimulus of preparation for an examination test, he may never know anything about those other subjects at all.

Reference to an old London University Calendar will show the list of subjects that had individually and separately to be taken and passed in during my own student period—in addition to any attempt to carry some one or more to a higher grade so as to secure specific honours tested by a separate and supplementary additional paper:—

Matriculation.	First B.Sc.	Second B.Sc.
Latin	Mathematics (Trig. and Conics)	Organic Chemistry
Greek	Physics	Physiology
French or German	Inorganic Chemistry	Geology and Palæontology
Arithmetic and Algebra	Zoology	Logic and Moral Philosophy.
Geometry	Botany.	
English Language		
English History and Geography		
Mechanics		
Chemistry.		

Then, on this basis of general knowledge, the doctorate gave an opportunity of carrying some subdivision of one of these subjects to a very much higher stage. Options must be allowed sooner or later, of course, but the question is how soon an option should be allowed. A multitude of options at an early stage is liable to produce a crop of specialists. Such a crop may be necessary for the world's work, but the process of raising it can scarcely be called an education suited to the development of a human being.

While writing, and without presuming to comment on anything concerning London organisation, may I, as an outsider, venture to express a hope that Finsbury Technical College will not be closed? The admirable work done there in the past, and the great names associated with it, entitle it to be held in honour. Let us hope that its benefits will be continued to a generation seemingly more desirous of instruction than ever before. OLIVER LODGE.

January.

Heredity and Biological Terms.

WILL you allow me space for a short comment on the recent discussion in NATURE on Sir Archdall Reid's letters? The chief point raised by Sir Archdall Reid seems to me to be of great importance, and very far from being a side-issue. The usual custom of speaking of "characters" in living beings as either "innate" *or* "acquired": the product of either nature *or* nurture: or of describing them by other pairs of terms of similar import, does lead to much confusion in the minds of many when studying the production of "characters," and very especially that of human characters. Some seventeen years ago, when making a study of this kind, I was aided greatly by many communications I had with Sir Archdall Reid, and particularly by an article entitled "Biological Terms," published in the final number of *Bedrock* in 1914, which virtually sets forth the main position advocated by him in the present discussion. I do not intend to touch on any conflicting views on modes of hereditary transmission which may enter into this discussion, but are not strictly relevant to Sir Archdall Reid's main contention, except to say that the particular difficulty which he points out and strives to conquer can concern only those biologists who do not regard the modern Lamarckian hypothesis as established, or even as verisimilar. If that hypothesis were verified the whole contention would fail.

Sir Archdall Reid's chief point is that it would be a great benefit to science if all branches of it which deal with life adopted a like classification of "characters." At present biologists generally classify characters as "innate" *or* "acquired," while physiologists tend to classify characters from the point of view of the influences, or "nurture," which produce them. He takes, for instance, the case of a hand, a sixth digit on it, and a scar on it. The physiologist says all these characters are products of some kind of nurture, and tries to find out what kind it is. That is the physiologist's business. The biologist, concerned mainly with "nature," says the hand and the sixth digit are "innate" and the scar "acquired." In a certain sense both are right. But the physiologist's language implies that all "characters" are both inborn and acquired, while the biologist's implies that some are "inborn" and some "acquired." The language of the physiologists is always clear, while that of the biologists is very often obscure. Hence, probably, the absence among physiologists of the great divergences of opinion which exist among biologists.

Physiologists are mainly concerned with the development of the individual; biologists with heritage and evolution (or change in the heritage). Assuming that most biologists of the present day hold that heritage passes down the germ-tract, may it not be argued justly that if the child has a hand like the parent, there is no change in "nature" or "nurture"; that if the child has a sixth digit which the parent had not, there is a change in nature, or heritage, but none in "nurture"; and that if the child has a scar, there is no change in heritage, but only one in nurture? It therefore appears to me that Sir Archdall Reid's chief contention is very soundly based. If we think of a hand, scar, and sixth digit as "*characters*," as the physiologist does, they are all alike products of nature and nurture (innate and acquired); if we think of them as *likenesses and differences between individuals*, the hand indicates an innate likeness, the digit an innate difference, and the scar an acquired difference; and if we think of them in *terms of the germ-plasm*, the hand and the scar indicate no change, but the digit is a change (or, in biological language, a "variation").

The burden of Sir Archdall Reid's complaint is that biologists have thought and expressed themselves in terms of "characters," not of the germ-plasm; and that this has largely caused the misleading question, widespread beyond all scientific borders, as to whether "nature" or "nurture" is the stronger influence. This is especially notable in relation to the production of "characters" in the higher animals, and most of all to that of the most distinctive characters of man. Sir Archdall Reid thus insists that a vague terminology has caused neglect of the evolution of the power of developing in response to functional activity; and that, with a more precise terminology, the simple statement, "*Variations are the sole cause of non-inheritance; apart from variations, like exactly begets like when parent and child develop under like conditions*," will cover almost the whole field and thus leave biology free to deal with the many problems of immense scientific and practical importance which concern it.

In my own inquiries I have found that the common assumption of human characters being rigidly divisible as to their origin into two groups, "innate" *or* "acquired," constitutional *or* environmental, is a cause of much confusion; and I think that the import of Sir Archdall Reid's exposition of this matter has

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not been accorded adequate attention or weight. Nor, after studying the discussion of it in NATURE, can I see any material difference between the views of Sir Ray Lankester and those of Sir Archdall Reid.

H. BRYAN DONKIN.

London, February 1.

The Scientific Glassware Industry.

I HAVE read with very great interest the article on the optical glass industry published in NATURE of January 20, and should like to direct attention to the condition of the scientific and illuminating branches of the glass industry, which are in the same position as the optical section and of equal importance to the nation. The manufacture of scientific glassware, practically non-existent in the country prior to 1914, was undertaken by several glassmakers at the urgent request of the Government, which, shortly after the outbreak of hostilities, discovered that the prosecution of the war was in danger of being impeded owing to the lack of supplies of these articles. The progress made in the manufacture of this apparatus has been very remarkable, especially when taking into consideration the comparatively short time it has been in existence in this country and the great difficulties with which the manufacturers had to contend. The latter have, however, succeeded in producing glass which is in many cases superior to German or Austrian pre-war glass, although it is freely admitted that in the early days the glass produced was in some cases of extremely bad quality. This has now been remedied, and one may fairly claim that, as regards both the quality of the glass and the technique and workmanship, British-made scientific apparatus now is among the best that can be produced anywhere.

The industry is, however, in grave danger of being again completely lost to this country. Owing to prevailing conditions Germany, Austria, and Czecho-Slovakia are trading under conditions which make it impossible for British manufacturers to compete, and the factories have no alternative but to cease work almost immediately unless the Government gives some very definite assurance that the promises it made when it asked the manufacturers to undertake this work will be very shortly redeemed. The industry has not been in existence sufficiently long to enable the manufacturers to create reserves to fight and meet this competition in the ordinary way. On the contrary, the present loss to those engaged in the industry is extremely large, and it is mainly for this reason that they cannot continue production without the assistance of the Government, the most suitable form of which would be legislation on the lines of the Dyes Bill. The large majority of users of industrial and scientific apparatus have considered this question, and have joined with the manufacturers in urging upon the Government the necessity for immediate action in order that they shall not again have to rely upon foreign countries—and possible future enemies—for supplies of glass which is so vital, not only to the scientific and industrial worlds, but also to the very defence of the nation.

T. LESTER SWAIN.

The British Chemical Ware Manufacturers'
Association, Ltd., 51 Lincoln's Inn Fields,
London, W.C.2, January 31.

Greenland in Europe.

WITH reference to the letter by "T. R. R. S." in NATURE of January 27, p. 694, I may be allowed to add some explanatory remarks which could not be included in the very condensed synopsis of my Cardiff paper. The map showing Spitsbergen as "Greenland" appears in "An Easy Introduction to the Arts and Sciences," by R. Turner, jun., LL.D., late of Magdalen Hall, Oxford, author of "An Easy Introduction to Geography," etc. The copy cited is the fifteenth edition of that work, and it was issued in 1812 by Longman and other London booksellers. The first edition may be assumed to have been printed about twenty years earlier, with or without that map.

It is difficult for us to determine how far the nomenclature of the 1812 edition was then regarded as old-fashioned. To this very day we call the ocean that stretches from the west coast of Spitsbergen southward to the Arctic Circle "the Greenland Sea." For what length of time that expanse of water has borne that name is an interesting question; at any rate, there is no room for doubting that our seventeenth-century whalers and mariners regarded the Spitsbergen region as specially "Greenland."

As for the passage from Goldsmith's Geography, quoted by "T. R. R. S." as indicating another point of view, he will find, I think, on fuller consideration, that it does not conflict with the map of 1812, because Goldsmith's statement that icebergs or ice-floes "are to be met with on the coasts of Spitzbergen, to the great danger of the shipping employed in the Greenland fishery," clearly implies that the scene of "the Greenland fishery" lay off the western seaboard of Spitsbergen. That the latter name was given in the first place to the mountain peaks is manifest; indeed, an Arctic voyager of 1653 illustrates the different application of the two terms. On his outward voyage towards Vaigatz his ship sighted the distant peaks of "Spitzbergen" to northward, but when a visit was afterwards paid to the great whaling station in that archipelago he speaks of the land as "Greenland." Probably the two names have been used interchangeably for many generations.

DAVID MACRITCHIE.

Edinburgh, January 29.

The Mild Weather.

IN continuation of the letter on the above subject in NATURE of January 20, it may be of interest to give a few facts for the calendar month of January, since high temperatures were so persistent throughout. From the beginning to the end of the month there was a neck-to-neck race for record temperature between the Januarys of 1916 and 1921. The temperature at Greenwich for the civil day as published by the Registrar-General's weekly returns shows the supremacy for warmth to be claimed by January of the present year, when the mean for all the maximum readings was 50·0° F., the minimum 40·8°, and the mean of the mean maximum and minimum 45·4°. For January, 1916, the corresponding means were 50·4°, 40·1°, and 45·3°. There is only a trifling difference between the results for the two Januarys, which are the warmest during the last eighty years. In January, 1916, the days were slightly warmer than in 1921, whilst in January, 1921, the nights were appreciably warmer than in 1916.

The two years 1916 and 1921 are the only instances with the January mean maximum temperature 50° or above, and they are also the only instances with the mean minimum temperature 40° or above. In January, 1916, there were nineteen days with the shade temperature 50° or above, and eighteen such warm days in January, 1921; whilst in 1916 there were three nights with the temperature 45° or above, and in 1921 nine correspondingly warm nights. In both years the mean temperature for January was 7° above the normal.

CHAS. HARDING.

65 Holmewood Gardens, S.W.2, February 4.

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